CLAIMS

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. A method for manipulating genetic material, the method comprising:

a) disrupting cells so as to liberate genetic material contained in the cells;

b) contacting the genetic material to a column in a manner to cause the genetic material to become immobilized to the column;

c) labeling the immobilized genetic material; and

d) eluting the labeled material from the column.

2. The method as recited in 1 wherein the step of labeling the genetic material further comprises maintaining the column at a temperature of between 45 °C and 100 °C.

3. The method as recited in claim 1 wherein the column comprises a means for subjecting the silica to pressure.

4. The method as recited in claim 3 wherein the pressure means is a syringe.

5. The method as recited in claim 1 wherein the step of labeling the genetic material comprises:

a) contacting double-stranded nucleic acid molecules of the genetic material with radical-generating complexes for a time and at concentrations sufficient to produce free-aldehyde moieties;

b) reacting the aldehyde moieties with amine to produce a condensation product; and

c) contacting the condensation product with a chromophore.

6. The method as recited in claim 5 wherein the step of contacting the condensation product with a chromophore further comprises reducing the condensation product and cross-linking the reduced condensation product with the chromophore in one reaction step.

7. The method as recited in claim 1 wherein the column is a solid substrate selected from the group consisting of silica, ground glass filter, pulped glass filter, HNO3-washed glass filter pulp, HNO3-washed gel, HNO3-washed diatoms, silicic acid 400 mesh silica gel, SPE-SIL and combinations thereof.

8. A two-buffer process for manipulating genetic material, the process comprising:

a) contacting cells containing the genetic material to a silica column;

b) creating a first fraction of cell detritus and a second fraction containing the genetic material;

c) confining the genetic material to the column;

d) removing the cell detritus;

e) subjecting the genetic material to radicals so as to produce reactive aldehyde groups on the genetic material; and

f) attaching chromophore to the genetic material.

9. The process as recited in claim 8 wherein the genetic material is contacted with radical in aerobic conditions.

10. The process as recited in claim 8 wherein the genetic material is contacted with radical in anaerobic conditions.

11. The process as recited in claim 8 wherein the step of creating a fraction of cell detritus and the genetic material comprises contacting the cells with a lysis buffer.

12. The process as recited in claim 8 wherein steps a) through f) occur in approximately 20 minutes.

13. The process as recited in claim 8 wherein the two buffers comprise a first buffer to lyse the cells and a second buffer to attach the genetic material to the column.

14. The process as recited in claim 13 wherein the first buffer and second buffer contain guanidine thyocianate and EDTA.

15. The process as recited in claim 13 wherein the first buffer and the second buffer contact the cells simultaneously.

16. The process as recited in claim 8 wherein the genetic material is bound to chromophore in aerobic conditions.

17. The process as recited in claim 8 wherein the genetic material is bound to chromophore in anaerobic conditions.

18. The process as recited in claim 13 wherein the first buffer and the second buffer are present in a relative weight ratio of 9:4.

19. The process as recited in claim 8 wherein the temperature is maintained at 95 °C.